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The Effectiveness of the Parents as Teachers Program with Low-Income Parents and Children

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The association between poverty and compromised development, particularly in the early years, has been well documented. Many early childhood programs have been designed to promote positive parenting and more enriched home environments in order to enhance children's development. We describe findings from a multisite, randomized evaluation of the Parents as Teachers (PAT) program with 665 families, which was designed specifically to investigate the program's effectiveness with low-income families. The observed effects of the PAT program on parenting and child development outcomes were generally small, with few statistically significant effects. More consistent positive effects were noted for very low-income parents and their children relative to more moderate income parents. The discussion focuses on the policy implications of the findings for the design and implementation of early childhood parenting programs for low-income families and future research.

Children in the United States have the highest rates of poverty in the Western industrialized world. Overall, more children in the United States live in poverty today (20.8%) than two decades ago (15%; Lewit, Terman, & Behrman, 1997). The rate of poverty among young children—defined as the percentage of children under the age of 6 who live in families with a combined income below the federal poverty line—is higher than for any other age group. Currently, nearly one in five young children live in poverty in the United States; almost half of them live in extreme poverty (i.e., in a household with an income below 50% of the poverty line; National Center for Children in Poverty, 2001).

Child development experts agree that poverty exacts a heavy toll on children. Children from poor families are at greater risk for developmental problems than are children from non-poor families (Aber, Jones, & Cohen, 2000; Brooks-Gunn & Duncan, 1997), and they face significantly reduced chances for later life success, both economically and socially (Zill, Moore, Smith, Stief, & Coiro, 1995). Furthermore, poverty incurred during the first 5 years of life is more detrimental to later achievement than poverty incurred later in childhood. In summarizing current research on the association between economic hardship and compromised development, an expert panel commissioned by the National Academy of Sciences concluded, "Economic conditions in early childhood may be far more important for shaping children's ability, behavior and achievement than conditions later in childhood" (Shonkoff & Phillips, 2000, p. 277).

This conclusion was based on abundant research showing that family income is strongly related to a young child's physical health, cognitive ability, and school achievement (Aber, Jones, & Cohen, 2000; Brooks-Gunn & Duncan, 1997). Analyses of national longitudinal data show that children who are poor are 1.3 times more likely than children who are not poor to experience learning disabilities and developmental delays (Brooks-Gunn & Duncan, 1997). Additional research has found that children from poor families are more likely to score lower on standardized tests, be retained in grade, and drop out of school (Lewit et al., 1997; Zill et al., 1995). Emotional and behavioral development is also compromised by poverty, although to a somewhat lesser degree than cognitive development. Data from the Infant Health and Development Program (IHDP) show that young children living in chronic poverty had more internalizing and externalizing behavior problems than children not living in

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poverty (Brooks-Gunn & Duncan, 1997). Children in poverty have been found to have lower levels of sociability and initiative (Hanson, McLanahan, & Thompson, 1997), more problematic peer relations (Loeber & Dishion, 1983; Shaw et al., 1998), and more frequent disruptive classroom behaviors (Patterson, Kupersmidt, & Vaden, 1990; Zill et al., 1995).

To a large degree, the effect of income on child development occurs through a young child's home environment, including opportunities for learning through positive mother–child interactions and the provision of cognitive and emotional stimulation (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Duncan, Brooks-Gunn, & Klebanov, 1994; Garrett, Ng'andu, & Ferron, 1994). For instance, a recent study investigating the effect of the home learning environments of high-income versus low-income preschool children found that the income difference accounted for as much as one half of the gap in their developmental test scores (Smith, Brooks-Gunn, & Klebanov, 1997).

Given the high rate of young children living in poverty, it has become increasingly important to identify strategies that promote their well-being (Brooks-Gunn, 1995; Brooks-Gunn & Duncan, 1997). Recent research has stressed that increases in income alone, absent the improvements in home environment, will not be sufficient to benefit the development of young children (Shonkoff & Phillips, 2000). For example, a study of children whose mothers received welfare payments indicated that mothers needed more than remedial education or job training to affect their children's development; they needed training in effective parenting practices. The researchers concluded that despite high expectations about their children's performance in school, "many low-income mothers do not seem to know precisely what to do at home to get their children ready for school" (Zill et al., 1995, p. 56). Maternal parenting skills affect both home environment and mother–child interactions and have been identified as an important pathway through which poverty influences child outcomes. Increasing a young child's opportunities for learning by promoting an enriched home environment therefore offers a promising focus for intervention (Brooks-Gunn & Duncan, 1997; Gomby, Culross, & Behrman, 1999).

Parenting programs, often delivered through home visits, seek to help parents develop the knowledge and responsive parenting behaviors necessary to provide an enriched environment that supports children's learning (Halpern, 2000; Kendrick et al., 2000). Growing public policy supports programs for families whose children may be particularly at risk of poor outcomes, such as families living with significant poverty (Duncan et al., 1994; Kendrick et al., 2000; Werner, 2000). However, there is a great need for research about which program models are most effective, particularly with low-income families. Recognizing this need, the National Academy of Sciences expert panel called for "rigorous evaluations that examine causal links between parenting interventions and specific parent (or parenting) outcomes and that assess mediated pathways from treatment effects on the parent to developmental impacts on the child" (Shonkoff & Phillips, 2000, pp. 407–408).

In this article, we present data that address this need—data from a multisite, randomized evaluation of the Parents as Teachers (PAT) program that was designed specifically to investigate the effectiveness of this program with low-income families. The PAT program encourages positive child development through parenting education that is provided in regular home visits and group meetings by trained parent educators. PAT serves families with children through age 5, has been in operation more than 20 years, and currently has more than 2,600 local programs in the United States and six other countries serving more than 500,000 children annually. Four research questions regarding the effectiveness of PAT are addressed:

- What effects does PAT have on parents' knowledge, attitudes, behaviors, and interactions with their children?
- Are any of the effects observed for parents similar or different for low-income and more moderate income families?
- What effects does PAT have on children's development?
- Are any of the effects observed for children similar or different for low-income and more moderate income families?

METHOD

PAT Program Overview

PAT is a universal-access, family-focused parent education program that emphasizes parenting behavior as the vehicle through which positive effects on children are to be achieved (Parents as Teachers National Center, 2001). PAT was designed for voluntary participation by all types of families and is based on the tenet that all parents deserve to be supported in their role as their children's first teachers. The program's major goals are the following:

1. Empower parents to give their children the best possible start in life through increased knowledge of child development and appropriate ways of fostering growth and learning;
2. give children a solid foundation for school success;
3. prevent and reduce child abuse;

> 4. increase parents' feelings of competence and confidence; and
> 5. develop true home–school–community partnerships on behalf of children.
> (Winter, 1999, p. 179)

The PAT program involves

- regularly scheduled home visits (typically monthly) by certified parent educators who provide information about children's development, model and involve parents in developmentally appropriate activities, and respond to parents' questions and concerns;
- parent group meetings to discuss child development and build informal support networks with other parents;
- periodic developmental screenings; and
- referrals to community services, as needed.

Parent educators schedule home visits at convenient times for the parent, discuss the child's development, demonstrate and model activities with a variety of learning materials, and address questions raised by parents.

The PAT program model is based on the work of Burton White (1985), who believed that all families would be aided by receiving expert knowledge on parenting. PAT uses individual, home-based instruction and group interactions to inform parents of young children about good parenting practices and principles of child development. The standard curriculum used in the home visits begins prenatally and emphasizes different developmental stages through the first 3 years of life. Additional curricular materials meet the particular needs of parents of 3- to 5-year-olds, parents who are teenagers, and parents whose children attend childcare centers. Improved knowledge in these areas is expected to help parents feel competent in their role and to provide the environment and the personal interactions with their children that will support positive child development. A healthy, well-developed child who is ready for school is the ultimate intended result. (Detailed information about PAT can be found at www.patnc.org; see Note 1.)

PAT Multisite Evaluation Overview

Results presented here are part of a comprehensive multisite evaluation that employed a randomized experimental design to assess the effect of key parenting and child outcomes related to PAT program goals. This evaluation also sought to examine how family and program factors contribute to variations in child and parent outcomes, with a major focus on family income (more details are available in Wagner, Spiker, Gerlach-Downie, & Hernandez, 2000; Wagner, Spiker, Hernandez, Song, & Gerlach-Downie, 2001; available at www.sri.com/policy/cehs/publications/pdf)

Sample

The staff of the study coordinating center at SRI International worked with the staff at the PAT National Center to identify programs from which to draw the study sample. Initial selection criteria required that the program (a) be in operation for at least 2 years, (b) provide services to a minimum of 100 new families annually, (c) serve a high proportion of low-income families, (d) offer home visits at least monthly, and (e) participate in the evaluation. Four sites were selected to participate, but one site subsequently withdrew (see Note 2). The three participating sites were large programs in geographically dispersed urban areas. Meeting the evaluation requirement of being able to serve a large number of new families makes these programs unusual in comparison to the majority of PAT programs. However, the sites were selected in collaboration with the PAT national center, which requires that staff visit PAT programs to observe their implementation of the PAT program model. All the sites selected had been certified by the PAT national center as implementing the PAT model with high fidelity and quality (i.e, the types, frequency, and reliability of the activities occurring in the home visits were implemented as the program designers intended). The parent educators completed PAT training and were certified by PAT trainers. The parent educators in the evaluation were an ethnically diverse group; most were female, ranging in age from 22 to 60 years, with between 1 and 12 years of home visiting experience; and most had an associate, a bachelor's, or master's degree, with training in child development and/or early childhood education.

Families were recruited when children were less than 8 months of age (15.5% enrolled prenatally, 84.5% between 1–8 months of age, most between 3–6 months of age) and were asked to participate until the children's third birthdays. Families agreed to random assignment to the PAT or a comparison group and understood that the PAT group would have monthly home visits by a trained and certified parent educator, beginning shortly after enrollment into the study and to continue until the child was 3 years old. Families were recruited through multiple sources: community information packets given to new parents, public health nurses who visited new mothers, personnel at schools that housed PAT programs, parent educators, and community social service agencies (e.g., Women, Infant, and Children [WIC] programs). Enrolled families were randomly assigned by the study coordinating center to a PAT participant or control group at each of three sites (balancing sociodemographic factors), with a 60% chance of assignment to the control group and a

40% chance of assignment to the PAT participant group (group assignment probabilities were selected to increase statistical power while also maximizing the number of new families that PAT programs could accommodate). The program was provided free of charge, and families in both groups received a $20 gift certificate as an incentive to complete the annual data collection visit. (The evaluation was truncated at children's second birthdays because too few families continued to participate beyond that point in two of the three communities to warrant continuing through third birthdays; thus, the findings here may underrepresent the full effects of PAT that might have been achieved if families had been followed through the natural conclusion of the program at third birthdays.)

A total of 665 children and families were recruited and randomly assigned to the PAT participant group (*N* = 275, 41%) or the control group (*N* = 390, 59%). Table 1 shows the maternal and household characteristics of the families in the evaluation at enrollment and at the Year 2 assessment period. Almost 60% of households reported incomes of less than $15,000 per year; 80% reported incomes of less than $25,000. Almost one in five families (18%) reported receiving Temporary Assistance to Needy Families (TANF) benefits, and 63% participated in Medicaid.

Participant and control group parents were assessed at children's first and second birthdays; children were assessed at second birthdays only. The first assessment included 147 (53%) participant group members, whose children were an average age of 12.8 months and 197 control group members (50.5%), whose children were an average of 12.5 months old. The second assessment included 107 participant group members (39%) and 159 (41%) control group members, whose children were an average of 24.5 and 24.1 months old, respectively. Comparisons on maternal, child, and household characteristics revealed no significant or systematic differences between the participant and control groups at enrollment or at children's first or second assessments (see Note 3). (Although the attrition was high, it does not affect the group comparisons we present in this report, but issues about attrition will be addressed in the Discussion section.) For additional information about attrition and engagement, refer to Wagner, Spiker, Gerlach-Downie, and Hernandez (2000), and Wagner, Spiker, Linn, Gerlach-Downie, and Hernandez (2002).

TABLE 1. Parent and Household Characteristics at Enrollment and at Year 2 Assessment

Characteristics	At enrollment	At Year 2
Mother's age		
Average age	24.1 (0.4)	24.3 (0.4)
Percentage younger than 20	28.2 (2.7)	25.2 (2.7)
Mother's ethnicity (%)		
European American/White	29.4 (2.8)	29.6 (2.8)
African American	58.2 (3.0)	60.3 (3.0)
Hispanic/Asian/Other	12.4 (1.9)	10.1 (1.8)
Mother's education		
Average highest grade level	12.0 (0.1)	12.1 (0.2)
Percentage with:		
Less than high school	36.9 (2.9)	31.2 (2.8)
Some postsecondary education	30.4 (3.1)	49.6 (3.1)
Percentage currently enrolled in school	17.6 (2.4)	11.9 (2.0)
Mother's employment (%)		
Working full-time	20.8 (2.8)	27.2 (2.9)
Working part-time	14.4 (2.4)	16.7 (2.4)
Not working or seeking work	44.7 (3.3)	56.1 (3.2)
Marital status (%)		
Single	54.1 (1.9)	59.2 (3.0)
Married	30.4 (2.8)	28.1 (2.8)
Living with partner	11.7 (1.2)	5.6 (1.4)
Divorced, widowed, separated	3.8 (0.7)	1.5 (0.5)
Household composition (%)		
Father living in the household	54.8 (2.9)	52.4 (3.0)
Household has two married parents	29.1 (2.8)	28.1 (2.8)
Child has siblings	40.2 (3.0)	40.4 (3.0)
Household living arrangement (%)		
In other's home	37.6 (2.8)	32.7 (2.9)
Rented	43.9 (3.0)	46.5 (3.0)
Owned their own home	18.4 (2.6)	20.5 (2.5)
Household socioeconomic (%)		
Annual income		
Less than $15,000	59.8 (3.1)	56.9 (3.0)
$15,000 to $24,999	20.7 (2.7)	20.6 (4.5)
$25,000 to $39,999	7.1 (1.4)	9.7 (1.8)
$40,000 or more	12.4 (2.1)	12.7 (2.0)
Benefit program participation (%)		
AFDC/TANF	18.3 (2.2)	18.1 (2.4)
Medicaid	63.2 (3.0)	60.0 (3.0)
Sample size	663	663

Note. Numbers in parentheses are standard errors. AFDC/TANF = Aid to Families with Dependent Children/Temporary Assisstance to Needy Families.

Data Sources and Measures

The data reported in this article come from the following sources:

Enrollment Form. PAT recruitment staff at the study sites recorded demographic and background information about each family at the time of enrollment or shortly thereafter.

Family Interview. At or around the birthdays of enrolled children, families were visited in their home by a trained assessor, who conducted an in-depth interview. Assessors were hired, trained, and supervised by SRI staff and were unaware of families' group assignments. The interview included questions about the family's home environment and demographics and incorporated the instruments described below.

Parenting Knowledge and Attitudes Measures. Parent knowledge of child development and parenting attitudes were assessed with items included on the family interviews drawn from several parenting measures. Items were tailored to the age of the child, as well as to the specific PAT curriculum covered in the first and second years of the program, and included some items contained in the *Knowledge of Infant Development Inventory* (KIDI; MacPhee, 1989). Items were summed to define subscales about general child development; language/cognitive development; emotional development; and child care and safety. The *Parenting Sense of Competence* scale (PSOC; Gibaud-Wallston & Wandersman, 1978) is a 17-item questionnaire that measures parenting attitudes using positive and negative statements about parenting that parents indicated were "very true for you, somewhat true for you, not very true for you, or not at all true for you." Items were summed to yield a total score and two subscale scores for parenting satisfaction and parenting efficacy. The 6-item *Child Maltreatment Precursor Scale* (CMPS) from the Adult-Adolescent Parenting Inventory (Bavolek, 1984) was included as a measure of views about corporal punishment. Finally, we considered parents' responses on a 4-point scale (ranging from *not at all happy* to *very happy*) to the following question: In general, how happy have you been whenever you have taken care of [child's name] in the last year?

Home Observation and Measurement of the Environment (HOME). The version of the HOME Inventory designed for families of children ages birth through 3 years was used to assess the home environment and parenting behaviors at children's first and second birthdays (Caldwell & Bradley, 1984). The 45 items of the HOME were completed by the SRI field evaluator in the home of enrolled families. The full HOME score and subscale scores were obtained by assigning a value of 1 for every item answered positively during the assessment and summing items.

Parenting Behaviors Related to Promotion of Early Literacy. One area of particular interest in the PAT curriculum involves language-, literacy-, and numeracy-promoting behaviors. To assess impacts on these kinds of behaviors, parents were asked questions about direct verbal interactions with children in the course of routine activities (i.e., talking to children, reading aloud from things like cereal boxes, and counting or using numbers), intentionally engaging children in word play (i.e., telling stories, saying nursery rhymes, singing songs), and reading to children (e.g., frequency of reading, asking questions of the child about what is being read). Each question was answered on a 4-point scale, with 4 being the most positive response. An overall scale was formed by summing the values on six items.

Nursing Child Assessment Satellite Training (NCAST). The teaching scale from the NCAST (1994; see http://www.son.washington.edu/centers/ncast) was used at children's second birthdays to assess mother–child interactions. (No measurement was taken at first birthdays because we did not believe sufficient change in parent–child interactions would have occurred by that time to warrant this fairly extensive and expensive measurement.) This measurement involves having the trained observer ask a mother to introduce a new toy to her child and record the interactions of the mother and child in the process of exploring the new toy. Ratings are made of such behaviors as cue-giving and responsiveness to cues of both the parent and child.

Developmental Profile II (DPII). The DPII (Alpern, Boll, & Shearer, 1984) measures physical, self-help, social, academic/cognitive, and communication aspects of a child's development, as reported by his or her parent and observed by the field evaluator during the in-home assessment at age 2. The DPII contains several items that describe skills children can perform, in 6-month age ranges. Skills were assessed at increasingly higher age levels until the child could not perform any of the skills included at two consecutive age levels.

Adaptive Social Behavior Inventory (ASBI). The ASBI (Scott & Hogan, 1987) is a parent-report measure of young children's prosocial behavior, which was incorporated in the family interviews. This instrument yielded a total score.

Data Analysis

For each parenting and child outcome measure, the participant and control groups were compared for families with very low-incomes (less than $15,000) and those of more moderate incomes ($15,000 or higher). (In the full study analyses, effects also were calculated for the full sample and for the sample at each participating site; see Wagner, Spiker, Hernandez, et al., 2001). Effect sizes, which express the difference between groups as a proportion of the pooled standard deviation of the two groups, indicate the positive or negative effects of the program on the participant group relative to the control group. Effect sizes of .10 to .30 generally are considered small, those from .31 to .50 are considered moderate, and those larger than .50 are considered large effects (Cohen, 1988; see Note 4). In addition, t tests were done to assess the statistical significance of the participant/control group differences at each assessment.

RESULTS

The results are organized according to outcomes for measures of parenting knowledge, attitudes toward parenting, parenting behaviors, and then for measures of child development and behavior.

Parenting Outcomes

Parent Knowledge. Scores for parenting knowledge on most measures were notably lower for very low-income families, suggesting they were generally less well-informed parents (see Table 2). However, stronger positive effects were noted among the very low-income families on four of the six knowledge measures, with the strongest effects being on the overall score and on knowledge of language and emotional development (*ES* = .33, .31, and .35); none of the group comparisons reached statistical significance. In contrast, no positive effects on the parent knowledge scores were noted for more moderate-income families.

Attitude Toward Parenting. Table 3 shows only marginally lower scores for low-income families than for those with more moderate incomes, unlike the differences noted in parent knowledge scores. Also, unlike findings related to parent knowledge, stronger positive impacts did not accrue to the very low-income group. In fact, small-to-moderate negative effects were noted on all PSOC scale scores for both groups. However, there were small positive effects on the CMPS score in both years for very low-income families, compared with negative effects for the more moderate-income group. In contrast, there was a large, statistically significant positive effect on parents' self-reports of happiness when caring for their children among families with more moderate incomes (*ES* = .58, $p < .001$).

Parenting Behaviors. Scores were lower on all HOME measures for very low-income families than for those with more moderate incomes (see Table 4). Findings generally were inconsistent regarding whether the two income groups benefited differentially from participation in the PAT program. For example, at the second assessment, the largest measured effect was a statistically significant, moderate effect on acceptance of

TABLE 2. Outcomes for Parent Knowledge Items, by Income Level

	Very low income			More moderate income		
	% Answered correctly			% Answered correctly		
KIDI item	Participant group	Control group	*ES*	Participant group	Control group	*ES*
All items						
At 1-year assessment	74.8 (1.5)	74.7 (1.4)	.02	82.6 (1.7)	84.9 (1.0)	–.19
At 2-year assessment	**72.3** (2.3)	**68.0** (2.0)	**.33**	80.2 (1.5)	81.2 (1.2)	–.09
General child development						
At 1-year assessment	82.3 (2.5)	76.5 (2.4)	.26	84.1 (2.3)	82.8 (1.6)	.08
At 2-year assessment	67.3 (3.5)	66.6 (2.6)	.04	77.1 (2.2)	76.0 (1.6)	.07
Language/cognitive development						
At 1-year assessment	65.6 (2.2)	70.3 (2.0)	–.29	76.6 (2.1)	79.4 (1.2)	–.19
At 2-year assessment	**76.3** (3.6)	**70.2** (2.8)	**.31**	81.0 (2.4)	85.3 (1.5)	–.27
Emotional development						
At 1-year assessment	70.4 (2.7)	71.2 (2.6)	–.04	79.9 (2.8)	82.9 (1.9)	–.14
At 2-year assessment	**73.7** (4.0)	**66.3** (3.0)	**.35**	81.8 (2.3)	80.6 (2.1)	.07
Discipline						
At 1-year assessment	82.0 (2.6)	79.4 (2.6)	.13	85.7 (2.5)	89.9 (1.7)	–.22
At 2-year assessment	69.7 (4.5)	68.1 (3.6)	.06	78.6 (3.0)	80.2 (2.5)	–.07
Child care and safety						
At 1-year assessment	78.2 (2.5)	77.7 (2.4)	.03	89.7 (2.1)	92.2 (1.5)	–.16
At 2-year assessment	66.7 (4.9)	61.7 (3.4)	.20	80.0 (3.0)	82.5 (2.4)	–.12
Sample size (1-year/2-year assessment)	57/31	61/47		64/55	100/84	

Note. Bold type indicates moderate and large effects. Numbers in parentheses are standard errors. KIDI = Knowledge of Infant Development Inventory (MacPhee, 1989).

children's behavior (*ES* = .49, *p* < .01), measured for the more moderate-income group. This group also had a stronger effect for the overall HOME score (*ES* = .29) and the opportunities for daily stimulation subscale (*ES* = .21). In contrast, the very low-income group had moderate effects at the second assessment on the organization of the environment (*ES* = .31) and appropriate play materials subscales (.33), on which the more moderate-income group registered only small effects.

Unlike some of the other parent outcomes examined, very low-income families did not have consistently lower scores on language-, literacy-, and numeracy-promoting behaviors than more moderate-income families (see Table 5). The very low-income group, however, did have more positive effects than the wealthier group at the second assessment, including small benefits on the overall language/literacy/numeracy promotion scale score (*ES* = .17) and moderate benefits on reading aloud and telling stories to children (*ES* = .31 and .49, *p* < .05), the latter effect reaching statistical significance. Effects were more likely to be negative than positive for the more moderate-income group, although all effects were small.

NCAST measures were somewhat lower for the very low-income group than for less-poor families (see Table 6). Impacts measured by the NCAST generally were positive but inconsequential for the lowest-income group and were small and mixed in direction for the more moderate-income group.

Child Outcomes

Scores for the five areas of child development that were assessed at children's second birthdays with the DPII (cognitive, social, communication, physical, and self-help) are expressed as the average month's difference between the chronological age of the child and his or her developmental age. As with many of the parent measures, scores for children in the very low-income families were substantially below those of children from more moderate-income families on all dimensions (see Table 7). For example, months differential on communication development was less than half as great for the poorest children, compared with their more moderate-income peers.

However, the effects for the poorest children were somewhat stronger and more consistent. Small positive effects were noted for the poorest children on three of the five DPII measures, and a moderate effect was found on the ASBI score; one small negative effect was noted (self-help development). This contrasts with one small positive

TABLE 3. Outcomes for Parent Attitude Measures by Income Level

	Very low income			More moderate income		
Outcomes	Participant group	Control group	*ES*	Participant group	Control group	*ES*
Average score, *Parenting Sense of Competence Scale*[a]						
At 1-year assessment	**53.6** (0.9)	**55.7** (0.7)	**–.34**	**54.6** (0.8)	**56.3** (0.5)	**–.30**
At 2-year assessment	52.2 (1.0)	53.2 (1.0)	–.17	54.7 (0.7)	55.4 (0.5)	–.14
Parenting efficacy subscale[b]						
At 1-year assessment	28.3 (0.5)	29.1 (0.3)	–.26	28.6 (0.4)	28.8 (0.2)	–.06
At 2-year assessment	28.4 (0.4)	29.0 (0.4)	–.20	28.7 (0.3)	28.7 (0.2)	–.02
Satisfaction subscale[c]						
At 1-year assessment	25.3 (0.7)	26.6 (0.6)	–.27	**26.0** (0.6)	**27.6** (0.4)	**–.36**
At 2-year assessment	23.8 (0.8)	24.2 (0.7)	–.10	26.0 (0.6)	26.7 (0.4)	–.16
Average *Child Maltreatment Precursor Scale* score[d]						
At 1-year assessment	18.4 (0.4)	18.1 (0.3)	.12	19.8 (0.4)	20.0 (0.3)	–.08
At 2-year assessment	17.2 (0.4)	16.8 (0.3)	.18	18.6 (0.3)	19.2 (0.3)	–.22
Percentage of mothers reporting being "very happy" when they took care of child in last year						
At 1-year assessment	86.8 (4.6)	86.4 (4.5)	.01	90.9 (3.9)	92.4 (2.8)	–.05
At 2-year assessment	80.6 (7.1)	74.5 (6.4)	.15	**98.2** (1.8)	**83.1** (4.1)	**.58*****
Sample size (1-year/2-year assessment)	57/31	61/47		63/55	100/84	

Note. Bold type indicates moderate and large effects. Numbers in parentheses are standard errors.

[a] Gibaud-Walston & Wandersman (1978); total scale (range = 17–68). [b] Range = 8–32. [c] Range = 9–36. [d] From *Adult-Adolescent Parenting Inventory* (Bavolek, 1984); range = 6–24.

$^{***}p < .001$.

TABLE 4. Outcomes for Parenting Behaviors Impacts Measured by the HOME Inventory by Income Level

	Very low income			More moderate income		
Outcomes	Participant group	Control group	*ES*	Participant group	Control group	*ES*
Average total HOME score						
At 1-year assessment	29.3 (1.0)	30.3 (0.9)	–.12	37.2 (0.8)	37.1 (0.7)	.02
At 2-year assessment	34.7 (1.9)	33.9 (1.0)	.11	39.7 (0.4)	38.6 (0.5)	.29
Average HOME subscale scores related to:						
Parental responsivity						
At 1-year assessment	7.3 (0.3)	7.6 (0.3)	–.11	9.3 (0.2)	9.3 (0.2)	.02
At 2-year assessment	8.6 (0.5)	8.8 (0.4)	–.07	10.0 (0.2)	9.9 (0.2)	.08
Acceptance of child's behavior						
At 1-year assessment	5.4 (0.2)	5.7 (0.2)	–.17	6.3 (0.2)	6.5 (0.1)	–.17
At 2-year assessment	5.4 (0.3)	5.4 (0.3)	.04	**6.5** (0.2)	**5.9** (0.2)	**.49****
Organization of the environment						
At 1-year assessment	4.9 (0.2)	5.1 (0.1)	–.13	5.5 (0.1)	5.5 (0.1)	.00
At 2-year assessment	**5.7** (0.2)	**5.4** (0.2)	**.31**	5.7 (0.1)	5.6 (0.1)	.14
Appropriate play materials						
At 1-year assessment	5.7 (0.3)	5.6 (0.3)	.03	7.4 (0.2)	7.4 (0.2)	.01
At 2-year assessment	**7.2** (0.4)	**6.4** (0.3)	**.33**	8.3 (0.1)	8.2 (0.1)	.14
Involvement with child						
At 1-year assessment	3.1 (0.2)	3.3 (0.2)	–.10	4.8 (0.2)	4.6 (0.2)	.11
At 2-year assessment	4.7 (0.3)	4.9 (0.3)	–.14	5.1 (0.2)	5.1 (0.2)	.01
Opportunities for stimulation						
At 1-year assessment	2.8 (0.2)	3.0 (0.2)	–.16	3.9 (0.1)	3.8 (0.1)	.10
At 2-year assessment	3.1 (0.2)	3.0 (0.2)	.12	4.1 (0.1)	3.9 (0.1)	.21
Sample size (1-year/2-year assessment)	56/30	60/45		62/54	99/80	

Note. HOME = *Home Observation for Measurement of the Environment* (Caldwell & Bradley, 1984). Bold type indicates moderate and large effects. Numbers in parentheses are standard errors.
$^{**}p < .01$

effect (the ASBI score) and three small negative effects for children from families with more moderate incomes.

Summary of Effects

Table 8 summarizes the parent and child impacts at second assessments associated with PAT participation. The intent is to examine the pattern of results across measures. The table shows that the very low-income families experienced somewhat greater benefits than their more moderate-income counterparts, as indicated by the patterns in the effect sizes. However, of all the comparisons in Table 8, only three were statistically significantly different: only one for the low-income PAT versus control comparison and only two for the moderate-income PAT versus control groups. Of the 28 parent outcome measures summarized in the table, very low-income parents showed positive effects on 14, with effects being moderate in size for seven of the outcomes (effect sizes of .31–.50), small for seven others (effect sizes of .10–.30), and statistically significant for one. In comparison, more moderate-income parents demonstrated positive effects on eight measures, with two being moderate to large (.49 and .58) and statistically significant. Child outcomes similarly favored very low-income families in terms of patterns of effect sizes, with their children achieving small benefits in three developmental domains measured by the DPII and a moderate positive effect on prosocial behavior measured by the ASBI. Only a small effect on the ASBI was noted for children of more moderate-income families. It is important to note, however, that even for the very low-income group that received greater benefit, positive impacts as indicated by mainly small effect sizes were found for only half the outcomes summarized in the table.

DISCUSSION

We have presented data from a multisite evaluation of the PAT home visiting program in an effort to respond to the directive from policymakers that research should be focused on evaluating programs to families whose children may be particularly at risk for poor outcomes, such

TABLE 5. Outcomes for Language- and Literacy-Promoting Parenting Behaviors by Income Level

	Very low income			More moderate income		
Mean scale score	Participant group	Control group	*ES*	Participant group	Control group	*ES*
Average language/literacy/numeracy promotion scale score[a]						
At 1-year assessment	18.8 (0.5)	17.9 (0.6)	.24	19.4 (0.5)	19.3 (0.4)	.04
At 2-year assessment	19.7 (0.4)	19.1 (0.5)	.17	20.1 (0.5)	20.2 (0.5)	–.03
Average language/literacy/numeracy promotion subscale score[b]						
While doing everyday things, parent:						
Talks to/asks child questions						
At 1-year assessment	3.2 (0.1)	3.1 (0.1)	.10	3.3 (0.1)	3.3 (0.1)	.00
At 2-year assessment	3.2 (0.2)	3.4 (0.1)	–.30	3.4 (0.1)	3.4 (0.1)	.04
Reads aloud to child						
At 1-year assessment	**3.0** (0.1)	**2.5** (0.2)	**.46***	2.8 (0.1)	2.8 (0.1)	.01
At 2-year assessment	**3.2** (0.2)	**2.8** (0.2)	**.31**	3.0 (0.1)	2.9 (0.1)	.17
Counts, sings, says counting rhymes, or uses numbers with child						
At 1-year assessment	3.1 (0.1)	3.2 (0.1)	.02	3.1 (0.1)	3.2 (0.1)	–.11
At 2-year assessment	3.5 (0.2)	3.3 (0.1)	.26	3.4 (0.1)	3.4 (0.1)	.04
Tells stories, says nursery rhymes, sings with child						
At 1-year assessment	3.5 (0.1)	3.3 (0.1)	.21	3.4 (0.1)	3.6 (0.1)	–.19
At 2-year assessment	**3.4** (0.2)	**2.9** (0.1)	**.49***	3.3 (0.1)	3.4 (0.1)	–.12
Looks at or reads books with child						
At 1-year assessment	2.8 (0.1)	2.8 (0.1)	–.03	3.3 (0.1)	3.2 (0.1)	.16
At 2-year assessment	3.0 (0.2)	3.0 (0.1)	.01	3.4 (0.1)	3.4 (0.1)	–.06
Talks to/asks child questions while reading to child						
At 1-year assessment	3.2 (0.2)	3.1 (0.2)	.07	3.5 (0.1)	3.2 (0.1)	.16
At 2-year assessment	3.4 (0.2)	3.6 (0.1)	–.19	3.7 (0.1)	3.8 (0.04)	–.25
Sample size (1-year/2-year assessment)	56/30	60/45		62/54	99/80	

Note. Bold type indicates moderate and large effects. Numbers in parentheses are standard errors.
[a]Range = 6–24. [b]Range = 1–4.
*$p < .05$.

TABLE 6. Outcomes for Parent–Child Interactions at Second Birthdays by Income Level

	Very low income			More moderate income		
Outcomes	Participant group	Control group	*ES*	Participant group	Control group	*ES*
Total NCAST scale score	49.5 (1.7)	48.7 (1.2)	.09	53.3 (0.9)	54.2 (0.9)	–.12
NCAST parent scale score	39.0 (1.4)	38.8 (1.0)	.03	41.2 (0.6)	40.4 (0.7)	.16
NCAST child scale score	10.5 (1.0)	10.0 (0.7)	.10	12.3 (0.7)	13.8 (0.5)	–.30
Sample size	30	47		54	82	

Note. Bold type indicates moderate and large effects. Numbers in parentheses are standard errors. NCAST = Nursing Child Assessment Satellite Training (NCAST, 1994).

as families living with significant poverty (Duncan et al., 1994; Gomby et al., 1999; Lewit et al., 1997; Werner, 2000). Although the effects of poverty on the development of young children have been well documented, much remains to be learned about which interventions are most effective in ameliorating the effects of childhood poverty.

TABLE 7. Children's Development at Second Birthdays by Income Level

	Very low income			More moderate income		
Outcomes	**Participant group**	**Control group**	***ES***	**Participant group**	**Control group**	***ES***
Developmental Profile II [a]						
Cognitive development	0.3 (0.7)	0.1 (0.5)	.07	3.0 (0.6)	4.0 (0.5)	–.22
Self-help development	4.3 (0.9)	5.5 (0.8)	–.23	6.4 (0.7)	6.3 (0.6)	.02
Social development	3.4 (1.0)	2.8 (0.7)	.12	5.2 (0.7)	6.2 (0.6)	–.22
Physical development	1.6 (1.1)	0.9 (0.8)	.12	2.9 (0.7)	3.6 (0.6)	–.12
Communication development	2.5 (0.7)	2.0 (0.6)	.12	5.9 (0.8)	5.8 (0.7)	.03
Adaptive Social Behavior Inventory [b] score	**70.8** (1.2)	**68.5** (1.2)	**.32**	73.3 (0.9)	72.6 (0.7)	.12
Sample size	31	47		55	84	

Note. Bold type indicates moderate and large effects. Numbers in parentheses are standard errors.
[a] Alpern, Boll, & Sheaver (1984); average month's differential. [b] Scott & Hogan (1987).

The findings from this study revealed that the effects of the PAT program generally were small, with few being statistically significant, and they did not accrue uniformly for all outcomes examined. These findings are consistent with several studies of two-generation programs for low-income families that found benefits on only some of the parent outcomes examined, such as the home learning environment; maternal behaviors and attitudes toward children (the AVANCE Family Support and Education Program; Johnson & Walker, 1991); parent–child interactions (the Comprehensive Child Development Program; St. Pierre, Goodson, Layzer, & Bernstein, 1994); and emotional support for children and child-rearing attitudes (the New Chance Program; Quint, Polit, Box, & Cave, 1994). Small and somewhat inconsistent impacts on child outcomes also are reasonably reflective of findings from other studies. For example, a research review by Olds and Kitzman (1993) found significant short-term program impacts on children's cognitive or behavioral development in fewer than half of the randomized trials they reviewed. Even programs that generated benefits to parents did not always result in benefits to children (Olds, 1992; Olds, Henderson, & Kitzman, 1994; Olds, Henderson, Tatelbaum, & Chamberlain, 1988). However, the findings from the current multisite study regarding child impacts are weaker than those produced by evaluations of some other PAT programs (Pfannenstiel & Seltzer, 1989; Pfannenstiel, Lambson, & Yarnell, 1995; Wagner & Clayton, 1999).

It is important to note that positive effects for both parent and child outcomes accrued more frequently to very low-income parents and their children than to more moderate-income families. The benefits to very low-income families in this study may be particularly important in light of the fact that their scores were lower than those of less-poor families on a majority of the parent and child outcome measures, suggesting that the PAT program could help close some of the gap between income groups in some aspects of parenting and child development.

Furthermore, the conclusion that PAT is at least as effective and likely more effective with families of children who are most at risk of poor development is consistent with two other recent evaluations of PAT. Wagner and Clayton (1999), in an evaluation of PAT in Salinas, California, found that more consistent and stronger benefits accrued to Spanish-speaking Latina mothers and their children relative to English-speaking Latinas and non-Latinas. In analyses at third birthdays from one site in the multisite evaluation of PAT reported here, which compared benefits to teen mothers and their children relative to older mothers (Wagner, Iida, Spiker, Hernandez, & Song, 2001), a more consistent pattern of benefits was evident for teen mothers and their children. One limitation of the results presented here that is common to such evaluations is the inclusion of multiple measures, with the resultant problem of having multiple statistical tests. Like other researchers, we were attempting to determine if a pattern of results existed across these multiple indictors of program effects. In addition, because the focus of the study was to compare income groups, the separation between the two income groups was not widely discrepant (i.e., many families in the moderate income group also had quite low household incomes). Because of sample size considerations, it was not possible to compare two widely discrepant income groups (e.g., less than $15,000 vs. greater than $50,000), which may have resulted in larger group differences.

Researchers, policymakers, and practitioners in the field of human service acknowledge the need to maximize the benefits of programs to young children born into pov-

TABLE 8. Summary of Outcomes at Second Birthday Assessments

Outcomes	Very low income	More moderate income
Parenting outcomes		
Parent Knowledge Scale	**+**	
General Child Development subscale		
Language Development subscale	**+**	–
Emotional Development subscale	**+**	
Discipline		
Child care and safety	+	–
PSOC Parenting Attitudes Scale	–	–
PSOC Parenting Satisfaction subscale	–	
PSOC Parenting Efficacy subscale		–
Parents' happiness caring for children	+	**++*****
Precursor of Child Maltreatment subscale	+	–
Total HOME Scale	+	+
Parental Responsivity subscale		
Acceptance of Child's Behavior subscale		**++****
Organization of Child's Environment subscale	**+**	+
Appropriate Play Materials subscale	**+**	+
Parental Involvement subscale	–	
Opportunity for Stimulation subscale	+	+
Language/Literacy/Numeracy-promoting Behavior Scale	+	
Talks to child while doing everyday things	–	
Reads aloud to child while doing everyday things	**+**	+
Counts, sings, or says counting rhymes or uses numbers	+	
Tells stories, says nursery rhymes, sings with child	**+***	–
Looks at books with child		
Talks to/asks questions of child while reading to child	–	–
NCAST Total Scale		–
NCAST Parent Scale		+
NCAST Child Scale		–
Child development outcomes		
DPII Cognitive Scale score		–
DPII Self-help Developmental Scale	–	
DPII Social Development Scale	+	–
DPII Physical Development Scale	+	–
DPII Communication Development Scale	+	
ASBI	**+**	+

Note. PSOC = *Parenting Sense of Competence* (Giband-Wallston & Wandersman, 1978) scale; HOME = *Home Observation for Measurement of the Environment* (Caldwell & Bradley, 1984); NCAST = Nursing Child Assessment Satellite Training (NCAST, 1994); DPII = *Developmental Profile II* (Alpern, Boll, & Shearer, 1984); ASBI = Adaptive Social Behavior Inventory (Scott & Hogan, 1987). +, – Direction of small effects. **+, –** Direction of moderate effects. **++** Direction of relationships that were moderate or large in size and statistically significant.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

erty. Experts recognize that problems exist in program implementation that prevent families living in significant poverty from becoming involved in even the most effective interventions (Werner, 2000). Successfully enrolling, engaging, and retaining families is a struggle for program directors and early interventionists, particularly for programs serving families whose children are at risk for poor outcomes (Gomby et al., 1999; Shonkoff & Phillips, 2000; Walker, Rodriguez, Johnson, & Cortez, 1995; Werner, 2000). Recent research on the dimensions of engagement in home visiting programs argues for a shift in thinking about enrolling and engaging families from being an all-or-none phenomenon to being a dynamic, multidimensional process (McCurdy & Daro, 2001; Wagner et al., 2000).

It is important to acknowledge two issues regarding implementation of this multisite study that likely have implications for the effects found. The first is that the intervention was evaluated only through children's second birthdays although the program is intended to serve families and children at least through third birthdays. Thus, we have not assessed the full effects of PAT if it were to be implemented as intended. The second issue relates to the first. The evaluation was discontinued in all but one site because a significant number of participant group families there never began home visits and many others dropped out of the program before second birthdays (Wagner et al., 2000). Thus, the level of actual intervention was significantly below the monthly home visits called for in the PAT model. It is likely that greater impact would have been observed if the intensity of intervention had been closer to expectations. This conclusion is supported by some earlier evaluations of PAT, in which mothers who received more intensive services benefited more (Wagner & Clayton, 1999).

The difficulties encountered in this study with regard to attrition and participation are now being more openly acknowledged by researchers and practitioners. For instance, in a recent review of home visiting program evaluations, Gomby et al. (1999) noted that of the studies reviewed, "between 20% and 67% of families leave the home visiting program before their intended completion" (p. 41), and across a wide range of home visiting programs "programs struggled to enroll, engage, and retain families" (p. 6). Gomby and her colleagues concluded that such difficulties reduce the ability of evaluations to address efficacy questions convincingly. Moreover, problems with recruitment, retention, and engagement also may require program modifications to increase the desired participation. In response to a recognition of the importance of key implementation issues, such as engagement, Gomby et al. stated that "national headquarters for key home visiting models should bring together researchers, practitioners, and parents to formulate practice standards and guidelines for their own models, and a dialogue should begin to create learning and quality improvement efforts for the field as a whole" (1999, p. 22).

In this evaluation, there was a great deal of variation in the participation of the mothers in the home visits. Among those randomly assigned to the PAT group, 22% never began any visits, 35% received some visits but dropped out by the Year 2 assessment, and 31% were still participating in home visits at the second birthday assessment (but even this group had received a variable number of visits overall). Because this study was designed as a randomized evaluation, all participants with outcome assessments are included in the analyses, as required in such designs. However, post hoc analyses aimed at determining if outcomes were related to "dosage" (receiving more of the intended home visits) provided some support for a positive relationship between receipt of more visits and better outcomes, but the results were not consistent across outcomes, nor were they much stronger than the results reported here (see Wagner, Spiker, et al., 2001).

We do not present such post hoc analyses in this report because they may detract attention from several key issues we want to raise. First, we need to conduct more quality evaluation research about early childhood and parenting programs for low-income families. Second, we need to face squarely the many issues about parent engagement in these programs. We would argue that attrition and engagement require explicit empirical attention. Future studies should be designed with the purpose of explicitly examining how we recruit and engage parents in early childhood and parenting programs. The study reported here is not at all unusual in having high attrition rates, difficulties in maintaining full participation in the program, and outcome data that show disappointingly small effects for both children and parents. We have argued elsewhere that parent engagement is a multidimensional phenomenon that goes beyond the usual issues of recruiting at the outset of a program and dropping out or staying in over time (Wagner et al., 2000; Wagner, Spiker, Linn, et al., 2002). In this evaluation, the high attrition rate and the less than optimal participation in the full intervention greatly limits the possibility of finding meaningfully important outcome effects. Like others, we report rather weak effects, and we are left with many questions about whether the intervention may be ineffective in producing intended effects or how much the small effects are influenced by insufficient implementation of the complete intended program.

Another limitation of this study was our inability to fully examine site differences due to the small sample sizes at the outcome assessment points. How differences in some of the parent characteristics and variations in attrition and program implementation may affect outcomes cannot be determined in this study. This problem does raise the issue of the generalizability of many of the program evaluation studies in the early childhood field in which single sites with relatively small samples are the norm. We suggest that future studies should pay closer attention to more fully documenting the sample and program implementation characteristics to allow for better meta-analysis approaches in program evaluation research.

The results also suggest that future research that compares different home visiting models or curricula should include measures that could explicitly capture information about participation and engagement, or studies should be intentionally designed to study engagement. For instance, studies are needed to test whether certain features of the programs, the home visitors, or the strategies used by the home visitors relate systematically to participation and engagement. We would argue that there are not enough good systematically gathered data about what goes on inside of homes during home visiting programs and how variations relate to the outcomes we strive to achieve. For instance, what kinds of strategies used by home visitors lead parents to follow through with the many literacy-promoting behaviors with their children suggested by home visitors? Does the ethnic match between the home visitor and parent predict continuing participation and the degree of behavior change in the parent? Do different approaches to recruitment affect retention and engagement? Is it possible to design follow-up studies that would interview parents who drop out of home visiting programs to explore more fully why they left and what might have lead to their continuing participation? While there is much conventional wisdom about why some parents drop out of such programs (e.g., parents are too busy or too stressed), empirical data to support many assumptions are limited.

Our results are consistent with other data indicating rather weak effects of home visiting programs, raising questions about why this is the case. One issue in need of more dialogue is the rather ambitious behavior change goals of many parenting programs. The focus of the PAT program is on child development and parenting behaviors, with an underlying assumption that benefits to children from PAT accrue largely through the positive parenting skills and behaviors parents learn and practice. This means that "success" requires behavior adoption or behavior change, not just mastery of knowledge. Parenting behaviors are complex, and changing them sometimes requires parents to "unlearn" behaviors that are deeply rooted in their own childhoods, family, and cultural traditions but sometimes not supported by influential relatives and neighbors in the parents' communities. Some changes also require commitment and perseverance on the part of parents, qualities that are difficult for some parents to maintain. Thus, whether such behavior changes are possible or likely with the kinds and intensities of programs like PAT is a question that should be examined more explicitly.

Finally, this study highlights some important methodological issues. We are beginning to have more early intervention, early childhood, and home visiting program evaluations that are using randomized designs, and such designs are being strongly advocated for the future (e.g., as in the recent recommendations of a national advisory panel about upcoming Head Start evaluations; Advisory Committee on Head Start Research and Evaluation, 1999). This move toward greater methodological rigor is an attempt to reach sound, unassailable conclusions. However, attrition and less-than-full participation in the interventions at their intended levels can hinder our ability to reach conclusions about efficacy. The challenges are formidable for both evaluators and program staff who implement the programs. It is important that we disseminate data and experiences from program evaluations like this one where problems with program implementation occurred and only modest impacts were found. Researchers and practitioners need to contribute their data, experiences, and insights about less than optimal program implementation in order to move the field forward in our understanding about what works and what does not work. If we do not bring these problems and challenges to light, openly discuss their meaning, and actively pursue strategies to remedy them, then the goals of improving access and quality of early parenting programs to promote the well-being of the neediest children and families we seek to serve will remain elusive. ◆

AUTHORS' NOTES

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NOTES

1. The randomized evaluation reported here was conducted prior to the implementation of the PAT Born to Learn curriculum and is based on the earlier PAT curriculum.
2. The fourth site withdrew shortly after the recruitment phase of the study due to a variety of problems, which included significant difficulties retaining staff, including turnover in the program director and many of the parent educators. The sample characteristics of parents at this site were similar to those at the other three sites.
3. There were some significant differences across the three communi-

ties on the background characteristics, but we were unable to analyze group differences within site because the sample sizes were not adequate for such comparisons. For instance, one community had significantly more teen mothers (41% vs. 22% and 24%; $p < .001$); one site had a higher proportion of White mothers (47% vs. 28% and 14%; $p < .001$). Mothers at one site were about half as likely to have some postsecondary education than at the other two sites ($p < .001$). The proportion of very low-income families (less than $15,000) at the three sites was 51%, 60%, and 69%, with the first site being significantly different from the second ($p < .05$) and third sites ($p < .001$).

4. The formula used for calculating effect sizes was (mean #1 – mean #2)/ the square root of (standard deviation #1^2 + standard deviation #2^2)/2). The pooled standard deviation takes into account heterogeneity of variances.

REFERENCES

Aber, J. L., Jones, S., & Cohen, J. (2000). The impact of poverty on the mental health and development of very young children. In C. C. H. Zeanah (Ed.), *Handbook of infant mental health* (2nd ed., pp. 113–128). New York: Guilford Press.

Advisory Committee on Head Start Research and Evaluation. (1999). *Evaluating Head Start: A recommended framework for studying the impact of the Head Start Program.* Washington, DC: U.S. Department of Health and Human Services, Administration of Children and Families. (Available at www.acf.dhhs.gov/programs/hsb)

Alpern, G. D., Boll, T. J., & Shearer, M. S. (1984). *Developmental profile II.* Los Angeles: Western Psychological Services.

Bavolek, S. J. (1984). *Handbook for the Adult-Adolescent Parenting Inventory* (AAPI). Eau Claire, WI: Family Development Resources.

Brooks-Gunn, J. (1995). Strategies for altering the outcomes of poor children and their families. In P. L. Chase-Lansdale & J. Brooks-Gunn (Eds.), *Escape from poverty: What makes a difference for children?* (pp. 87–117). Cambridge, UK: Cambridge University Press.

Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children, 7,* 55–71.

Brooks-Gunn, J., Duncan, G. J., Klebanov, P. K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent behavior? *American Journal of Sociology, 99,* 335–395.

Caldwell, B. M., & Bradley, R. H. (1984). *Home observation for measurement of the environment.* Little Rock: University of Arkansas.

Cohen, J. (1988). *Statistical power analyses for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early-childhood development. *Child Development, 65,* 296–318.

Garrett, P., Ng'andu, N., & Ferron, J. (1994). Poverty experiences of young children and the equality of their home environments. *Child Development, 55,* 97–111.

Gibaud-Wallston, J., & Wandersman, L. P. (1978). *Development and utility of the Parenting Sense of Competence scale.* Paper presented at the meeting of the American Psychological Association, Toronto, Canada.

Gomby, D., Culross, P., & Behrman, R. (1999). Home visiting: Recent program evaluations—Analysis and recommendations. *The Future of Children, 9*(1), 4–26.

Halpern, R. (2000). Early intervention for low-income children and families. In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp. 361–386). New York: Cambridge University Press.

Hanson, T. L., McLanahan, S., & Thomson, E. (1997). Economic resources, parental practices, and children's well-being. In G. J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor* (pp. 190–238). New York: Russell Sage Foundation.

Johnson, D., & Walker, T. (1991). *Final report of an evaluation of the AVANCE Parent Education and Family Support Program* (Report submitted to the Carnegie Corporation). San Antonio, TX: AVANCE.

Kendrick, D., Elkan, R., Hewitt, M., Dewey, M., Blair, M., Robinson, J., et al. (2000). Does home visiting improve parenting and the quality of the home environment? A systematic review and meta analysis. *Archives of Diseases of Children, 82,* 443–451.

Lewit, E. M., Terman, D. L., & Behrman, R. E. (1997). Children and poverty: Analysis and recommendations. *The Future of Children, 7,* 4–24.

Loeber, R., & Dishion, T. J. (1983). Early predictors of male delinquency: A review. *Psychological Review, 94,* 68–99.

MacPhee, D. (1989). *Knowledge of infant development inventory.* Unpublished manuscript. Chapel Hill, NC: University of North Carolina, Department of Psychology.

McCurdy, K., & Daro, D. (2001). Parent involvement in family support programs: An integrated theory. *Family Relations, 50,* 113–121.

National Center for Children in Poverty. (2001). *Child poverty fact sheet, 2001.* New York: Columbia University. Available at www.cpmcnet.columbia.edu/dept/nccp

Nursing Child Assessment Satellite Training Programs. (1994). *NCAST teaching scale.* Seattle: University of Washington.

Olds, D. (1992). Home visitation for pregnant women and parents of young children. *Journal of Diseases of Children, 146,* 704–708.

Olds, D., Henderson, C. R., Jr., & Kitzman, H. (1994). Does prenatal and infancy nurse home visitation have enduring effects on qualities of parental caregiving and child health at 25 to 50 months of age? *Pediatrics, 93,* 89–98.

Olds, D. L., Henderson, C. R., Tatelbaum, R., & Chamberlain, R. (1988). Improving the life-course development of socially disadvantaged mothers: A randomized trial of nurse home visitation. *American Journal of Public Health, 78,* 1436–1445.

Olds, D., & Kitzman, H. (1993). Review of research on home visiting for pregnant women and parents of young children. *The Future of Children, 3,* 53–92.

Parents as Teachers National Center. (2001). *What is PAT?* Retrieved from www.patnc.org/aboutus-whatispat.asp

Patterson, C. J., Kupersmidt, J. B., & Vaden, N. A. (1990). Income levels, gender, ethnicity, and household composition as predictors of children's school-based competence. *Child Development, 61,* 485–494.

Pfannenstiel, J., Lambson, T., & Yarnell, V. (1995). *The Parents as Teachers Program: Longitudinal follow-up to the second wave study* (Prepared for the Missouri Department of Elementary and Secondary Education). Overland Park, KS: Research and Training Associates.

Pfannenstiel, J. C., & Seltzer, D. A. (1989). New parents as teachers: Evaluation of an early parent education program. *Early Childhood Research Quarterly, 4,* 1–18.

Quint, J. C., Polit, D. F., Box, H., & Cave, G. (1994). *New Chance: Interim findings on a comprehensive program for disadvantaged young mothers and their children.* New York: Manpower Demonstration Research Corporation.

Scott, K. G., & Hogan, A. (1987). *The adaptive social behavior inventory.* New York: Harcourt Brace Jovanovich.

Shaw, D. S., Winslow, E. B., Owens, E. B., Vondra, J. I., Cohn, J. F., & Bell, R. Q. (1998). The development of early externalizing problems among children from low-income families: A transformational perspective. *Journal of Abnormal Child Psychology, 26,* 95–107.

Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000.) *From neurons to neighborhoods: The science of early childhood development.* Washington, DC: National Academy Press.

Smith, J. R., Brooks-Gunn, J., & Klebanov, P. K. (1997). Consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In G. J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor* (pp. 132–189). New York: Russell Sage Foundation.

St. Pierre, R., Goodson, B., Layzer, J., & Bernstein, L. (1994). *National evaluation of the Comprehensive Child Development Program: Report to Congress*. Cambridge, MA: Abt.

Wagner, M. M., & Clayton, S. L. (1999). The Parents as Teachers Program: Results from two demonstrations. *The Future of Children, 9,* 91–115.

Wagner, M., Iida, E., Spiker, D., Hernandez, F., & Song, J. (2001). *The multisite evaluation of the Parents as Teachers home visiting program. Three-year findings from one community.* Menlo Park, CA: SRI International.

Wagner, M., Spiker, D., Gerlach-Downie, S., & Hernandez, F. (2000). *Parental engagement in home visiting programs—Findings from the Parents as Teachers multisite evaluation*. Menlo Park, CA: SRI International.

Wagner, M., Spiker, D., Hernandez, F., Song, J., & Gerlach-Downie, S. (2001). *Multisite Parents as Teachers evaluation. Experiences and outcomes for children and families*. Menlo Park, CA: SRI International.

Wagner, M., Spiker, D., Linn, M. I., Gerlach-Downie, S., & Hernandez, F. (2002). *Dimensions of engagement in home visiting programs: An exploratory look*. Manuscript submitted for publication.

Walker, T., Rodriguez, G., Johnson, D., & Cortez, C. (1995). AVANCE Parent-Child Education Program. In S. Smith (Ed.), *Two generation programs for families in poverty: A new intervention strategy* (pp. 67–90). Norwood, NJ: Ablex.

Werner, E. (2000). Protective factors and individual resilience. In S. Meisels & J. Shonkoff (Eds.), *Handbook of early childhood intervention* (2nd ed.). New York: Cambridge University Press.

White, B. (1985). *The first three years of life*. Englewood Cliffs, NJ: Prentice Hall.

Winter, M. (1999). Parents as teachers. *The Future of Children, 9*(1), 179–189.

Zill, N., Moore, K. A., Smith, E. W., Stief, T., & Coiro, M. J. (1995). In P. L. Chase-Lansdale & J. Brooks-Gunn (Eds.), *Escape from poverty: What makes a difference for children?* (pp. 38–59). Cambridge, UK: Cambridge University Press.